

CLAIMS

1. A planetary transmission comprising:
 - an input means;
 - an output means;
 - a stationary transmission housing rotatably supporting said input means and said output means;
- 5 a first planetary gear mechanism having a first member continuously connected with said input means, a second member, and a third member;
- 10 a second planetary gear mechanism including a plurality of members with at least one member continuously connected with said output means;
- 15 at least first and second rotating-type torque-transmitting mechanisms selectively connectable between said input means and respective members of at least one of said planetary gear mechanisms;
- 20 said first rotating-type torque-transmitting mechanism being positioned radially outboard of and axially overlapped by said second rotating-type torque-transmitting mechanism; and
- each of said first and second rotating-type torque-transmitting mechanisms having an input member connected for co-rotation with said input means, said first rotating-type torque-transmitting mechanism having an apply piston slidably disposed in said stationary transmission housing, an apply plate rotatable with at least one portion of said first rotating-type torque-transmitting mechanism, and a bearing means disposed between said apply piston and said apply plate to accommodate rotation therebetween.

2. The planetary transmission defined in Claim 1 further comprising:

- said second rotating-type torque-transmitting mechanism having a second apply piston slidably disposed in said stationary transmission housing,
- 5 a second apply plate continuously rotatable with a portion of said second rotating-type torque-transmitting mechanism, and a bearing means disposed between said second apply piston and said second apply plate.

3. The planetary transmission defined in Claim 1 further comprising:

- said input means including an input planetary gear set;
- a third rotating-type torque-transmitting mechanism positioned
- 5 axially adjacent said input planetary gear set opposite said second rotating-type torque-transmitting mechanism; and
- said third rotating-type torque-transmitting mechanism having a third apply piston slidably disposed in a second stationary housing which is connected with said stationary transmission housing, a third apply plate
- 10 rotatable with a rotatable portion of said third rotating-type torque-transmitting mechanism, and a bearing means disposed between said third apply piston and said third apply plate to accommodate relative rotation therebetween.

4. The planetary transmission defined in Claim 2 further comprising:

- a third rotating-type torque-transmitting mechanism aligned radially outboard of said first and second rotating-type torque-transmitting
- 5 mechanisms, and having a third apply piston slidably disposed in said transmission housing, a third apply plate connected for rotation with a portion of said third rotating-type torque-transmitting mechanism, and a

bearing means disposed between said third apply piston and said third apply plate to accommodate relative rotation therebetween.

5. A planetary transmission comprising:
 - an input member;
 - an output member;
 - a stationary transmission housing rotatably supporting said input member and said output member;
 - a planetary gear mechanism positioned within the transmission housing;
 - first, second and third rotating-type torque-transmitting mechanisms positioned within the transmission housing, and having first, second and third apply pistons, respectively;
 - said transmission housing forming first, second and third stationary piston chambers receiving said first, second and third apply pistons, respectively;
 - wherein said first, second and third piston chambers are positioned radially outboard of each other, sequentially.
6. The planetary transmission of claim 5, wherein said first, second and third rotating-type torque-transmitting mechanisms further comprise first, second and third apply members, respectively, and a bearing member positioned between each of said pistons and each of said apply members to accommodate rotation therebetween.
7. The planetary transmission of claim 6, further comprising a second bearing member operatively connected between the first apply member and an apply plate of the first torque-transmitting mechanism.

8. The planetary transmission of claim 6, wherein at least two of said first, second and third piston chambers are positioned axially overlapping each other.

9. A planetary transmission comprising:
 - an input;
 - an output;
 - a stationary transmission housing rotatably supporting said input and said output;
 - a planetary gear mechanism positioned within the transmission housing;
 - first, second and third rotating-type torque-transmitting mechanisms positioned within the transmission housing, and having first, second and third apply pistons, respectively;
 - said transmission housing forming first, second and third stationary piston chambers receiving said first, second and third apply pistons, respectively;
 - wherein said first, second and third piston chambers are positioned radially outboard of each other, sequentially, with at least two of said first, second and third piston chambers axially overlapping each other;
 - wherein said first, second and third rotating-type torque-transmitting mechanisms further comprise first, second and third apply members, respectively, a first bearing member positioned between each of said pistons and each of said apply members to accommodate rotation therebetween, and a second bearing member operatively connected between the first apply member and an apply plate of the first torque-transmitting mechanism.

10. A planetary transmission comprising:
 - an input;
 - an output;
 - a stationary transmission housing rotatably supporting said input
- 5 and said output;
 - a first planetary gear mechanism having a first member continuously connected with said input, a second member, and a third member;
 - a second planetary gear mechanism including a plurality of members with at least one member continuously connected with said output;
 - 10 at least first and second rotating-type torque-transmitting mechanisms selectively connectable between said input and respective members of at least one of said planetary gear mechanisms;
 - 15 said first rotating-type torque-transmitting mechanism being positioned radially outboard of and axially overlapped by said second rotating-type torque-transmitting mechanism; and
 - each of said first and second rotating-type torque-transmitting mechanisms having an input member connected for co-rotation with said input, said first rotating-type torque-transmitting mechanism having an apply
- 20 piston slidably disposed in a piston chamber formed by said stationary transmission housing, an apply plate rotatable with at least one portion of said first rotating-type torque-transmitting mechanism, and a bearing disposed between said apply piston and said apply plate to accommodate rotation therebetween.

11. A planetary transmission comprising:
 - an input means;
 - an output means;
 - a stationary transmission housing rotatably supporting said input means and said output means;
- 5 a first planetary gear mechanism having a first member continuously connected with said input means, a second member, and a third member;
- 10 a second planetary gear mechanism including a plurality of members with at least one member continuously connected with said output means;
 - at least first and second rotating-type torque-transmitting mechanisms selectively connectable between said input means and respective members of at least one of said planetary gear mechanisms;
- 15 said first rotating-type torque-transmitting mechanism being positioned radially outboard of and axially overlapped by said second rotating-type torque-transmitting mechanism;
 - each of said first and second rotating-type torque-transmitting mechanisms having an input member connected for co-rotation with said input means, said first rotating-type torque-transmitting mechanism having an apply piston slidably disposed in said stationary transmission housing, an apply plate rotatable with at least one portion of said first rotating-type torque-transmitting mechanism, and a bearing means disposed between said apply piston and said apply plate to accommodate rotation therebetween;
- 20 said second rotating-type torque-transmitting mechanism having a second apply piston slidably disposed in said stationary transmission housing, a second apply plate continuously rotatable with a portion of said second rotating-type torque-transmitting mechanism, and a bearing means disposed between said second apply piston and said second apply plate; and
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30 a third rotating-type torque-transmitting mechanism aligned
radially outboard of said first and second rotating-type torque-transmitting
mechanisms, and having a third apply piston slidably disposed in said
transmission housing, a third apply plate connected for rotation with a
portion of said third rotating-type torque-transmitting mechanism, and a
35 bearing means disposed between said third apply piston and said third apply
plate to accommodate relative rotation therebetween.